FLOODS VISIT AMES
Again and Again

"I do not see the wisdom of spilling water over the country at the rate it has deluged over this section of late. It seems to be a perfect waste!" The year was 1870 and LaVerne Noyes was writing to his father of his reaction to the widespread flooding of the Squaw Creek bottom lands all along the east side of the campus. Noyes was an undergraduate at Iowa State at the time and a member of the first class to graduate in 1872.

LaVerne Noyes became a successful manufacturer of farm equipment, especially the famous Aermotor windmills that later dotted the midwest landscape. Lake LaVerne, on Iowa State's Campus today, bears Noyes' name.

Would Noyes have had some advice for us today? Probably not, because all that Noyes was concerned about was flood waters surging over and through the timber pasture and open flat hay and corn land east of the campus. There were three plank bridges that connected the village wagon trails with the college grounds and the open country across the Squaw Creek and the Skunk River to the south and east. There were no buildings of any kind where the flood waters moved so menacingly to Noyes' way of thinking in 1870..

Noyes can remind us that the flooding of our river and creek bottom lands 'came first'; our people came later where the floods already were.

1993 WAS OUR YEAR OF THE FLOOD

Fourteen feet of water stood on Iowa State's basketball floor in Hilton Coliseum in June of 1993. The waters of Squaw Creek ran over Thirteenth Street, Lincoln Way, Elwood and South Duff, damaging major buildings and many homes adjacent to the creek west and south of Lincoln Way. Skunk River was on a rampage and was in turn a part of the Squaw Creek's back up waters that in turn confounded the down stream surge from Squaw Creek's high waters.

It appeared to have been an all-time flood stage for this area.

RECORDS OF OTHER YEARS

Perhaps so, but a review of the history of flooding on the Squaw and Skunk dating from the earliest days of Ames may be revealing. Note must be taken of changes that have taken place over the years; it is not just a matter of the amount and rate of rainfall, although that is a major item bearing on the subject of flooding.

In 1869, the year that Iowa State opened for its first student class, George Tilden arrived from his native home

back east and was making plans to locate in this small village where one of the primary indications for a bright future for the community was that "there is to be a college here."

On May 28,1869, Tilden wrote to his wife back in Vermont about their plans to move to central Iowa. He wrote these words, "The Skunk River is the highest it has been in four years. Considerable damage has been done to roads."

Three days later Tilden wrote further about local river flooding, "the roads are most impassable - much damage has been done - it is estimated that it will cost more than a thousand dollars to repair the roads and bridges in this town." That was a lot of money in 1869.

The first newspaper in Ames was the Intelligencer established in 1868. There are no remaining copies of that publication available until the issues of 1877. Stories of heavy rains were frequent but few statistics were given in their pages of the earliest dates.

With 1993 flooding vivid in our minds we examine the rainfall record for earlier years available from the Iowa Weather Bureau now located near the Des Moines River north of Des Moines.

1881 A YEAR OF RECORD RAINFALL

!881 appears to have been the year when Ames, and most of the State as well, experienced an all-time high, yearly total rainfall. Beginning that year rainfall statistics for the Ames area are available. Rainfall in 1881 exceeded fifty inches for the calendar year. From the published official Iowa Weather report for that year we find that Ames had 17.40 inches of rain in July with the greatest amount of 5.60 inches in one day. On July 9th the report indicated that over 5 inches fell in Story County. Elsewhere in that same report it is stated that during a three day period beginning on July 9th the "total rainfall in Story County exceeded 10 inches." [1]

That 1881 report did not specify the location for rainfall readings.[2] However, from records provided by the Iowa State University climatologists we find that a total of 16.31 inches of rainfall for the month of July 1881 was recorded adjacent to the Iowa State campus. Such records confirm the state report.

HIGHEST RAINFALL SINCE 1881

Keep in mind that in 1993, the year "of our flood" a recorded total of 16.39 inches of rain fell in Ames during the month of July. That appears to be the highest for the month of July since 1881, based upon rainfall records established at Ames. The final estimate for the total

rainfall in the Ames area for the 1993 calendar year was 56.35 inches as measured at an Ames weather station[3]. That compares with a calendar year total for Ames of 51.9 inches for the year 1881, with the exact location for those readings not specified. A review of long-range yearly rainfall records suggests that that 1993 was, in fact, a record year for the past 112 years.

May and June 1993 rainfall total of 14.94 inches in the Ames area, however significantly exceeded that of the the same two months in 1881 when the total 9.02 inches. This strengthens the idea that 1993 was a record breaking year for flooding here at the confluence of the Skunk River and Squaw Creek.

However, flood studies suggest that rainfall alone is only one factor in flooding. Heavy rains preceded by sustained wet weather results in a high level of ground saturation, such that subsequent rainfall produces more runoff and hence flooding onto the flood plains.

Other factors can be considerd as well. 1881 has still more to reveal to us about the history of flooding creeks and rivers in central Iowa.

Ames was hit hard by that flood of 1881. The July 23 issue of the Iowa Register[4], published in Des Moines, reported their correspondent's findings with a dateline of July 21st,

after he had traveled through the flood stricken Story and Boone County area. "The storm at Ames and vicinity did lots of damage; the first train just passed through as we arrived in Ames since the storm. Great sheets of water yet covered the bottoms around Ames"

Keep in mind that the Register's dateline for that story was almost a week after the main rains had fallen on the Ames area.

The Register's writer continued, "We left Des Moines Tuesday morning going north. Everywhere signs of the great flood were visable.....many of the towns had no mail for five or six days."

From Ames, the Iowa Register's correspondent moved on to Boone.... "In the town of Boone every bridge is gone." "Boone County is suffering worse, perhaps, in this direction than any other." He then visited Moingona, and describes the scene of the heroism of Kate Shelley, whose heroic crossing of the Railroad bridge, over the Des Moines River on the night of July 6th, has been long acclaimed.

1892

The May 19,1892 issue of the Ames Times stated that the "excessive rains of last week ... succeeded in stopping the Ames & College Railroad Company's (the Dinkey) trains.

Travel became impossible early Wednesday morning. One of the bridges is badly damaged, and the grade on Squaw Creek is washed away." Ames' rainfall during the month of May that year was the fourth highest for over a hundred year period in the Ames area.

1900

In 1900 the C.&.N.W. had changed their original single track main line to a two-track system. At that time the elevation of the tracks across the river and creek bottoms adjacent to Ames were raised. Also, at that time a bridge span of some 60' length was placed in the railroad's right of way several hundred feet west of the Squaw Creek bridge. The purpose of that structure was to provide flood waters coming down the Squaw Creek valley with an "escape valve" thereby taking pressure off of the main railroad bridge over Squaw Creek and also reducing the likelihood of roadbed washouts.[5]

DRAINAGE STRUCTURE BECAME ALSO AN UNDERPASS

Railroad bridge designers, by that time, were aware that it would be necessary to protect their main line bridge and tracks from pressure from future flood waters. When Sixth Street was extended to the Iowa State Campus in the late 1940s, the city entered into an agreement with the railroad to use that structure in a dual use by making of it an underpass for Sixth Street.

1902

In 1902 Ames experienced a total rainfall for the year of 45.79 inches which was about 50% above normal. In June a total of 10.01 inches fell locally. July followed with 8.06 inches and August with 7.12 inches bringing the total ninety day rainfall at Ames to 25.19 inches or over 50% of that years total. At the time, local papers carried frequent references to continuous wet weather. On June 12, 1902, a news item reported local damage to the C.&.N.W. tracks. "It has been a long time since the railroads had to be reported in this (respect), but the heavy rains of the past week or ten days have made all kinds of trouble for the railroads."

1909

Bottom lands around Ames were reported under water again in 1909. A year earlier a new bridge had been built over Squaw Creek on Lincoln Way, then known as Boone Street. The Ames Intelligencer of July 1, 1909 lead story headed, "Heavens Unloaded - Injures the Road" explained that the entire Squaw Creek bottoms were under water almost to the power plant. A portion of a dike that had been built between the railroad embankment south to Boone Street had been washed out. "All day Sunday....a force of men hauled

dirt to build this up and by sundown the gap was fairly closed."[6]

That 1909 account gives us a clear picture of problems that the flooded Squaw Creek had created. The bottoms were under water.."except for a small island on which many of the hogs and sheep were herded Sunday and until the flood had receded sufficiently so that they could be taken off. A large flock of sheep south of the tracks would have drowned had not a force from the College and the neighborhood gone into the water, finally landing them on the interurban tracks."

The 1909 news story referred to the new Melan bridge down on Boone Street (Lincon Way), stating that when it had been built the year before it had been thought that the three arched span would be adequate to take any potential flood waters. Just one year later the flood waters had practically filled the arches and severely threatend the new bridge. The article continued, "It was the opinion of experts who viewed the bridge Sunday that at least one more arch would be necessary." It was following a Squaw Creek Flood of June 1918 - just nine years later, that the bridge collapsed.[7]

It should also be noted that prior to 1908, the county supervisors had maintained a dry land plank span in the Boone Road (Lincoln Way) road bed midway across the Squaw

Creek bottoms as a potential escape valve for anticipated flood waters.

1915

In 1915 the September 29th issue of the Ames Times carried a front page report of excessive rain damage to roads and bridges adjacent to Ames. "The wooden bridge across the Skunk River east of Thirteenth Street went out early in the week and others were seriously threatened.[8]

A comparison of the years when Ames experienced flood damage reveals that, while in some instances, there was a correlation with widespread high rainfall totals, that has not always been the case. The rainfall may have been excessive only locally for a particular short time period. Flooding at any given location can be damaging either way.

DAMAGING FLOOD OF 1918

THE June 4,1918 Ames Evening Times reported heavy damage from "the most serious rain storm that has visited this section in years."... "Rain coming down in torrents fed rivers and small streams which already were swollen as the result of the precipitations of last week, causing them to overflow and flooding hundreds of acres of bottom land. Squaw Creek going on a rampage has made a great lake between Ames and the campus, the high waters taking out the foot

bridge leading from the cinder path, and great stretches of the Lincoln Highway grade were washed out. Street car traffic was abandoned."[9]

South Duff was under water as the Skunk and Squaw formed a vast lake in the area.

Prof. F.S.Wilkins, weather observer for the College Farm Crops (Agronomy) department reported that 2.93 inches had fallen Monday night bringing the total rainfall since 7 O'clock Sunday night (June 2nd) to 5.1 inches. The June 7, 1918 issue of the Times reported that 7.96 inches had fallen on Ames during the first five days of June. Precipitation in Ames for the month of May had been 6.45 inches with most of that falling after May 15th. The total rainfall for the 20 days through June 6th was locally registered at 14.41 inches. All of this indicates that the ground all around Ames had become saturated by the arrival of the heavy rains of June that year.

Local damage was reported to be high with basements full of water. The lead on the Times story of June 4th was that "Shortly after 3 o'clock this afternoon, the Lincoln Way bridge east of Ames "gave away under the pressure of the rising stream." The Lincoln Way bridge over Squaw Creek, that had been new just ten years earlier, fortunately withstood the actual flood stage but collapsed on the last

day of June having been seriouly weakened by the flood waters. The Goddard family of Ames were driving over the bridge just as it collapsed late in the day. They were rescued, but their car was left stranded on the remaining water and sewer mains that were located below the traveled road way of the bridge.[10]

Lincoln Way was not yet paved in 1918. A sixty foot segment of Lincoln Way west of the bridge had been washed out and was temorarily spanned with a plank bridge until the fill could be replaced. A temporary detour bridge was built around the washed out Squaw Creek bridge; it was not replaced with a new permanent bridge until late 1921.[11] As of that time the only buildings that were in the path of the Squaw Creek flood waters were a small number of portable hog shelters that were along the north side of Lincoln Way near the Beach Avenue corner.

There was no significant development in the low land areas, other than the Gas Plant located just east of Ames. A few minor farm buildings existed in 1918 east of town on Lincoln Way, South Duff Avenue or on Thirteenth Street east of the cemetery. Except for the concrete bridge over Squaw Creek, the bridges south and East of Ames were of the old narrow "red bridge" design. All were damaged seriously in that 1918 flood.

The gas plant at the foot of the hill just east of town was flooded and out of operation for some days as a result of that flood.

The total rainfall for 1918 was normal. However the sixty day total for the months of May June placed that year near the top for a fifty year period. The significance of the 1918 flood to Ames was the damages to local businesses, destruction of roads, bridges and crops.

As the population of Ames grew the flood stages were increasingly impacting our city. More notice and more concerns were involved.

THE WORST FLOOD IN HISTORY

In 1944 The flood waters again visited the plains of the Squaw Creek and the Skunk River adjacent to Ames with a vengeance.[12] Again the flooding was acclaimed to have been extreme in its effects; this time it was the "worst" in the history of local flooding, to quote the local headlines of that day. 4.53 inches fell on Ames the night of May 18th 1944, followed the next evening with 3.68 inches. That totaled 8.21 inches most of which was said to have fallen within a twenty-four hour period.

The 1944 downpour of May 19th fell within such a short period of time that water was running in the streets to

depths of several feet. Water fell so fast that homes located on relatively high ground experienced torrents of water pushing in grade windows and filling their basements. Street gutters could not move the water fast enough. A number of Main Street buildings were filled with water that had entered by basement windows or exterior stair wells. The Sheldon Munn Hotel's basement was full of water.

Thousands of dollars of merchandice was destroyed by flood waters. Montgomery Ward, J.C.Penney, Carr Hardware, Younkers Store, and the Ames Mattress Company were among those reporting heavy inventory losses. The Tribune had 14 inches of water on their floor at one time that night, and only one of four linotype machines were dry enough to use the next day.

The Grand Avenue underpass was completely flooded. Two motorists who had attempted to drive through it had to abandon their cars and swim to safety. The next day the underpass looked like a war zone with tons of soil washed down into the roadway.

College Creek had overwhelmed many Campustown business places because the drainage structures that carried the stream under the store buildings were not adequate to carry such a volume of water in so short a time. Much grocery and general merchandise were destroyed. A characteristic of

that 1944 storm was that the flood damages were spread generally over a large number of businesses and individuals.

FLOODING SINCE 1944

Those who have lived in Ames very long are familiar with the more recent times when the flood waters have covered the low lying areas in Ames adjacent to the Squaw Creek and Skunk River. The flooding that occurred on June 27, 1975 resulted in damage to new Iowa State Center buildings, and was described as being the "worst flood since 1918". Again in 1990, flooding in Ames rated the record books. In both those years damage to both private residential and commercial property was significant. In a sense, those occasions were just more proof of a flooding pattern that had long ago been established.[13]

When preliminary studies and reports had been prepared during the planning stage for the Iowa State Center the emphasis was directed toward "flood proofing" of the proposed structures.[14]

"Flood proofing" appears to have become a new term, but it was not a new thought. In 1937 when plans for a new Ames High School building were on the local agenda, there were persistent suggestions that the land west of Squaw Creek and north of Lincoln Way would be a suitable school site. An educational consultant from Iowa City had concluded that

such a site "eliminated itself since the cost of protecting it from flood waters might well exceed the cost of the building." He was promptly criticised by proponents of the site for dismissing the location "out of hand' without first determining the cost of possible flood protection.

WHAT IT MEANS TO US NOW

One hundred and twenty-five years have passed since LaVerne Noyes expressed his opinion of the waters that overflowed the Squaw Creek bottom lands. The 1881 flood that was so well recorded in history was a hundred and fourteen years ago. We are told that there were a number of factors that may have contributed to the times and extent of past floods in this (or any geographic area). Such possible factors have included the construction of drainage ditches up stream to hasten the water away from cultivated fields and into the natural streams, and farming methods that have increased erosion.

Referring to drainage projects, Professor Fred W.Beckman wrote in 1913 that the cost of drainage ditching projects in Iowa between 1893 and 1913 would exceed the total cost of the Panama Canal by at least fifty-million dollars.[15]

However, the most significant change that has occurred over the years has been the increase in the number of structures that have been placed in the very spaces that repeatedly

have been the flooded plains. In 1881 the damage was limited to fences, crops, plank bridges and minor farm buildings. Each recorded flood experienced by us has had some increase in the quantity of man-made structures in the flood plains. Bridges became larger and of more permanent construction. There are more roadways. Land that had been classified as swamp lands at the time Ames was founded, and that lay within what is now our city limits, was filled to permit commercial developement. Some time before 1918 an earth dike was constructed west of Squaw Creek in the hopes of diverting flood waters away from crops.

By 1993 Ames had raised and widened the road beds adjacent to the Squaw and Skunk. Ellwood Drive was a major improvment; it closely parallels Squaw Creek and functions as a dike as well as a roadway.. All roadways are now paved. Paved parking lots and large buildings are there to be dealt with by the occasional rampaging waters that the local streams try to handle in the manner dictated by the laws of nature. The results have been clear and obvious to many observers.

Referring to the flooding along the Mississippi in 1993, Bruce Hannon, professor of geography at the University of Illinois said that, "The flood damage and the resulting human anguish now taking place on the Mississippi River is

not caused by Mother Nature...it is the result of the work of man...."[16]

Hannon continued, "Flood sounds negative to most people, but to nature it is an expected event, historically bringing a rich supply of nutrients, followed by a burst of growth."

In 1993, televised commentaries called attention to the fact that when a dike broke on one side of the Mississippi the waters flooded hundreds of adjacent acres, and as that happened, water flowed off of hundreds of flooded acres on the opposite side of the river. Nature always has had to be reckoned with. Water has the power to find "its place" on the map. The point is that when you protect one site you, in turn, jeopardise another

It is a simple principle that when you put rocks in a bucket it will hold less water. Today, there is a growing recognition of such realities. A seemingly new concensus has it that the flood plains are a "part of the stream bed". The flood plain is literally a part of Mother Nature's <u>rain barrel</u> built into her system for both storage and development.

An historical perspective suggests that it is there that the matter rests. After all, the American Indians had the reputation of never locating <u>their</u> villages in flood plains.

Notes:

1. Report of the Iowa Weather Service - For the Year 1881 - by Dr.Gustavus Hinrich, Director. Des Moines Iowa. pp 118 and 276.

2. Report, Iowa Weather Service for the year 1881, By Dr.Gustavus Hinrichs, Director. Readings are shown for the Ames Station, the exact location for readings may be obtainable but are not shown in report summary.

3. The recorded rainfall estimates at Ames for the calendar year of 1993 were as follows (from two local stations). There were 56.35 inches measured at the agronomy station located "southwest southwest" of Ames. The measurement of 58.06 inches at the station located southeast of Ames (at the City's water treatment plant.

4. Later became the Register and Leader and is today the Des Moines Register.

5. This structure was C.&.N.W. Bridge No.564 on the bridge engineering plans.

6. The earth levee had been built sometime after 1902, I believe. It extended north from Boone Street as far as the railroad tracks. separating the timber pasture that lay along the west side of Squaw Creek from the crop land on the bottom land that stretched to the higher ground of the main college campus. It would have been about where Elwood Drive is located today.

7. The Melan Bridge was a patented bridge design obtained for a fee by County supervisors. The bridge was guaranteed for five years. A news item announcing the opening of the bridge stated that "it ought to last for all ages". See: Ames Intelligencer - December 31, 1908 - front page story entitled, "Fine Structure Now Complete".

   Prior to 1908 the Squaw Creek bridge had been protected by placing a second plank bridge span in the roadway about mid-way across the grade to the west. That second short span was to provide an outlet for anticipated flood waters therby taking pressure off of the main bridge. See: The Ames Intelligencer of July 1,1909. "Heaven Unloaded - "Injures The Road" - front page.

8. Ames Evening Times for September 29, 1915. Article:"Much Loss From Recent Rains" F./p.

9. Ames Evening Times for June 4,5,7,1918 all major front page stories.

10. Ames Tribune, July 1,1918 front page story of the collapse.

11. Because the responsibility for replacing that bridge was divided between the county and the City of Ames, there were delays in decisions regarding the financing and the design of the new bridge. It was not until March of 1920 that the citizens of Ames voted a bond issue to pay the city's share of the bridge's cost. (See: March 11,1920 issue of the Ames Tribune.)

12. Ames Daily Tribune of May 20,1944 - Front page headline story.

13. Ames Tribune - June 27,1975 and June 18,1990.

14. State of Iowa Natural Resources Council's report - August 5,1966.

15. Ames Evening Times of April 30, 1913 p.8 "Millions for Drainage" by F.W.Beckman, Head of Agricultural Journalism at Iowa State College. 50,000 acres were drained in Story County alone.

16. College of Liberal Arts And Sciences, University of Illinois - News Letter - Winter 1994 Issue. Article entitled, "Don't Blame Mother Nature."

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